

PATENT SPECIFICATION

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DRAWINGS ATTACHED

- (21) Application No. 31511/68 (22) Filed 2 July 1968
 (45) Complete Specification published 21 Oct. 1970
 (51) International Classification B 05 b 5/04
 (52) Index at acceptance
 B2L 26H
 B2F 10H2C 10H3A3B 11A 2R 4A3A 4B1 4B4X 5D4C1A
 5D4C1Y
 (72) Inventor SIMONNE JUNE KERR



(54) APPARATUS FOR ELECTROSTATIC SPRAY COATING

- (71) We, AIR-O-STATIC INC., 27 Locust Avenue, Wallington, New Jersey, 07057, United States of America; a corporation organized and existing under the laws of the State of New Jersey, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—
- The present invention relates to improvements in electrostatic spray systems, and in particular to a novel and improved apparatus for spray coating articles wherein the deposition of the coating material is accomplished by means of electrostatic forces.
- In the application of liquid materials, protective coatings, paints, finishing materials, fungicides, bacterial solutions, and the like, in the form of a spray to various articles, it is well-known to provide an electrostatic field between a charging electrode and the article to be coated, the electrostatic field serving to charge the spray particles and deposit them upon the article to be coated. Such a spray system has found widespread use particularly in the field of paint spraying, because of the efficiency of the electrostatic field in depositing the spray upon the object to be coated.
- In the more recent developments of electrostatic spray deposition, an atomizer head is provided and is maintained at a very high electrical potential thereby serving as the charging electrode, while the article to be coated is maintained at ground potential, thereby creating a strong electrostatic field between the spray head and the work. If the applied voltage is sufficient, the field is effective to direct the liquid spray toward the grounded article to be coated and to deposit the spray on said article with very high efficiency.
- While in some systems, the coating materials are atomized mechanically, as by means of a conventional air spray gun, and the atomized particles are propelled physically in the electrostatic field between an independent charging electrode or grid and the article to be coated, where the atomizer head itself is maintained at high potential to become the charging electrode of the field, the coating material thereon would atomize by means of electrostatic forces if the material was formed in a thin film having a sharp edge. Such electrostatic atomization is advantageous in that it avoids the necessity of providing means for mechanical atomization. In commercial use, the atomizer head is usually in the form of a disc or cup which is rotated by a motor to feed the coating material in the form of a fine film to its edge.
- The provision of an atomizer head at high potential has its limitations and disadvantages. While deposition efficiency of the atomized spray increases with the increase of voltages employed, where electrostatic atomization is employed, it has been shown that there is a maximum potential gradient, above which the quality of atomization deteriorates. Thus deposition of the coating material suffers due to the requirements of electrostatic atomization. Further, where the atomizer head is maintained at a high potential and the articles to be coated are grounded, there is a tendency for arcing between the atomizer head and the articles, particularly where the head is brought close to the articles or where the articles are carried on a conveyor and swing toward the atomizer head. Since most coating compositions are combustible and some are highly inflammable, such arcing incurs a serious fire or explosion hazard. In addition, where the atomizer head is maintained at high potential, the coating material feed lines, pump and controls, as well as air and motor controls are also at high potential, presenting a serious shock hazard when they are approached by the operator.
- It has been thought necessary to maintain a high potential gradient between the atomizer head and the article to be coated in order to obtain proper electrostatic deposition, even

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Inventor: None

Assignee: None

Published / Filed: **1970-10-21** / 1968-07-02Application Number: **GB1968000031511**

IPC Code: None

ECLA Code: None

Priority Number: 1968-07-02 **GB1968000031511**
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 INPADOC
Legal Status:

| Gazette date | Code | Description (remarks) | List all possible codes for GB |
|--------------|--------|--|--------------------------------|
| 1976-02-04 | PLNP - | Patent lapsed through nonpayment of renewal fees | |
| 1971-05-12 | PS + | Patent sealed | |

Family:

| PDF | Publication | Pub. Date | Filed | Title |
|-------------------------------------|-------------------|------------|------------|-------|
| <input checked="" type="checkbox"/> | GB1209653A | 1970-10-21 | 1968-07-02 | |
| 1 family members shown above | | | | |

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 Other Abstract
Info:

None

